Patent claims

1. An air-conditioning device for vehicles,
   - having a fan for generating an air stream,
   - an evaporator which is arranged downstream of the fan and through which the air stream flows,
   - a distributor space which is arranged after the evaporator,
     - and in which the air stream can be divided by means of control flaps between a first flow passage and a second flow passage, so that it is possible to generate a first partial air stream and a second partial air stream,
     - the first flow passage opening out into a mixing chamber,
     - while a heat exchanger for heating the second partial air stream is arranged in the second flow passage and the second flow passage opens out in the mixing chamber downstream of the heat exchanger,
   - it being possible to generate a mixed air stream from the first and second partial air streams in the mixing chamber, air exit passages leading from the mixing chamber into different regions of the vehicle interior, with switching flaps, which control the air exit stream from the mixing chamber through the associated air exit passage, being assigned to the air exit passages on the mixing chamber side,
     - at least one of the air exit passages being the defrosting passage, which is used to generate an air stream directly on the inner side of a vehicle window, such as in particular the front windshield, of the vehicle and opens out at a defrosting nozzle assigned to the vehicle window,
     - in which there is arranged at least one bypass

passage, which branches off downstream of the heat exchanger, starting from the second flow passage upstream of the mixing chamber, opens out directly into the defrosting passage and through which a warm air stream can flow,

characterized in that

each bypass passage is assigned a mixing flap for controlling the warm air stream through the bypass passage.

2. The air-conditioning device as claimed in claim 1, characterized in that the position of the mixing flap is coupled to the position of the control flaps which divide the air stream into the first and second partial air streams.

3. The air-conditioning device as claimed in either of claims 1 and 2, characterized in that the mixing flap and control flaps are arranged on a common pivot axle.

4. The air-conditioning device as claimed in one of the preceding claims, characterized in that the mixing flap and control flaps are driven by means of a common actuator.

5. The air-conditioning device as claimed in claim 4, characterized in that the mixing flap and control flaps are driven by means of a common actuator, with a gear mechanism being arranged between the mixing flap and control flaps, in such a manner that the angular movement of the mixing flap is in a fixed ratio to the angular movement of the control flaps.

6. The air-conditioning device as claimed in one of the preceding claims, characterized in that the first flow passage is designed as an overflow passage with respect to the second flow passage,

within the course of which the control flaps are arranged, it being possible to define the ratio between the first partial air stream and the second partial air stream by means of the control flaps arranged in the region of the beginning of the first and second flow passages.

7. The air-conditioning device as claimed in claim 6, characterized in that each bypass passage runs in such a way that it passes through the first flow passage, the first flow passage having the bypass passage passing through it in particular in the region of the control flaps.

8. The air-conditioning device as claimed in one of the preceding claims, characterized in that the mixing flap and control flap are arranged on a common pivot axle, with the mixing flap extending within regions in which the bypass passage runs, while the control flap is formed in the other regions.

9. The air-conditioning device as claimed in claim 8, characterized in that the flaps extend in the axial direction of the common pivot axle and are curved in cross section with respect thereto.

10. The air-conditioning device as claimed in claim 9, characterized in that the flaps are articulatively mounted on the pivot axle by means of pivot arms which widen out in the shape of a segment of a circle and are preferably also arranged at the edge.

11. The air-conditioning device as claimed in either of claims 9 and 10, characterized in that the flaps which serve as mixing flap and are assigned to a bypass passage are curved convexly.

12. The air-conditioning device as claimed in one of claims 9 to 11, characterized in that the flaps which serve as control flap and are used to divide the air stream into first and second partial air streams are curved concavely.

13. A method for operating an air-conditioning device of a vehicle, in particular having the air-conditioning device as claimed in one of the preceding claims, having a bypass passage arranged in a flow passage, characterized in that the air stream which flows into a bypass passage is controlled by means of an air flap.

14. The method as claimed in claim 13, characterized in that the position of the air flap of a bypass passage is coupled to the position of the control flaps which divide the first and second partial air streams, this coupling in particular being mechanical in form.

15. The method as claimed in claim 14, characterized in that the actuating movement of the air flap is partially effected by the actuator of the control flaps.